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ered in the second chapter, there is hardly space enough allowed for a very complete discussion of the question. The optimistic point of view is taken that when the nature of the plasmic membranes is known, "it is not improbable that the solution of the problem of water transport will follow as the simplest corollary." In the next chapter the absorption and transmission of solutes is treated of, the important matter of quantitative selection is somewhat lightly referred to, and one is led to the belief that it is either taken as a matter of course, or that the author does not consider it of the same importance that many physiologists do. Simple diffusion is said to be the greatest factor in the distribution of solutes in the plant body. As to the influence of the osmotic pressure of the surrounding medium upon organisms, which is the subject of the final chapter, the author gives a summary of his own work in that line and of that of other investigators. Investigations have shown that growth is accelerated in weak solutions of various substances and retarded in concentrated ones. Cell division may also be influenced by the osmotic pressure of the surrounding medium, and reproduction being a peculiar form of cell division is apparently dependent, in some cases, upon the pressure. Whether the effect is due merely to the extraction of water, or to a strictly chemical influence the author does not decide.

While there is not a great deal that is new in the volume it is an excellent brief review of the various questions as they stand to-day. As a reading book for more advanced students in physiological botany the book will have considerable value, and it is one which may well be placed upon the shelves of the laboratory reference library. As a final source of information it cannot of course be satisfying, but the copious references to the literature make it valuable in this respect also. There is a distinct place for a book of this character.

H. M. R.

Pierce's Plant Physiology.¹ — In his preface the author expresses his desire to fill the gap in text books which exists between the monumental work of Pfeffer on the one hand, and the clever but short account of plant physiology which is found in Stasburger's text-book. The intention to furnish a good reading book of this character is certainly a laudable one, and in so far as the author has succeeded, he is to be congratulated. It is further stated that only "safe views"

¹ Pierce, G. J. *A Text-Book of Plant Physiology*. New York, Henry Holt & Co. 1903. 8vo., vi-291 pp., 22 figs.

of the various physiological processes will be given, and such a position may also be regarded as an excellent one. Too great conservatism, however, may easily lead to two serious difficulties, one is that the style may readily become unsuggestive and the other is that these very same "safe views" may become almost dogmatic. After an introductory chapter on the general problem of physiology the question of respiration is at once entered into and with it the correlated phenomena of fermentation. There may be some who would be inclined to doubt the entire wisdom of at once plunging into these complicated matters, before the student has been informed of what is known as to how or where the materials concerned in respiration are produced. This is especially true of the subject of enzyme action, and as a consequence the handling of this important topic is hardly satisfactory.

The space devoted to it is chiefly taken up with a consideration of yeast fermentation, and the great classes of intra-cellular enzymes are scarcely mentioned. The third chapter is on Nutrition and in the next, absorption of water and food is treated of. Here for the first time the fundamental question of osmosis is explained. The different, necessary chemical elements, are taken up in turn. In passing it may be mentioned that the literature quoted does not always include the latest contributions to the subject, by the authors named. The fifth chapter is devoted to the consideration of the primal phenomena of growth, and following it is a long one, entitled Irritability, under which head all growth responses, as well as the movements of nature organs, are taken up. As an example of unfortunately dogmatic statements may be mentioned the following, which is given as an explanation of phototropism: "The cells on the side of the stem away from the window receive less light and are less checked than those on the opposite side, and hence push the tip of the stem over towards the window." Such a definite explanation, on the basis of etiolation, as the cause of phototropic curvature would not be accepted by many physiologists, and is perhaps too "safe" a view to take of this perplexing response. Attention may also be called to the fact that the familiar term, etiolation is not used at all by the author, and that the term heliotropism is preferred to the generally admitted better one, phototropism. The last chapter deals in the compass of thirty pages with the subject of reproduction, including a three and one half page consideration of the problems connected with heredity. The index leaves something to be desired, not infrequently one must look in vain for references to familiar terms, such as hyponasty, epinasty, etiolation, etc.

It is perhaps unfair to the book to have picked out such passages, where the handling of the subject is not in accord with the ideas of the reviewer although many more might be cited. In the main it is a careful and conservative — almost too conservative — treatment of the subject of plant physiology. According to one's point of view, its faults or its virtues lie in the very definite, perhaps non-stimulating style, in which it is written. It will no doubt prove a useful addition to the somewhat slim stock of reading books in plant physiology which are at the disposal of the English reading student.

H. M. R.

Notes.— *The American Botanist* for April contains the following articles: — Bailey, "Violets"; Bradshaw, "The Chilicothe Vine"; Blight, "What is American Weed?"; Fetherolf, "Among Texas Ferns"; and Steele, "Species or Varieties?"

Part IX of *Hough's American Woods*, published at Lowville, N. Y., comprising nos. 201 to 225 inclusive of his admirable sets of radial, tangential, and cross sections of each species, is devoted to Pacific Coast species, and is accompanied by a text brochure including, in addition to an account of each of the species represented in this part, leaf and fruit keys to the entire series thus far issued.

The *Botanical Gazette* for April contains the following articles: — Davis, "Oogenesis in Saprolegnia"; Mottier, "The behavior of the chromosomes in the spore-mother-cells of higher plants and the homology of the pollen and embryo-sac mother cells"; Hitchcock, "Notes on North American grasses — III, New species of Willkommia," and Bower, "The morphology of spore producing members."

The Bryologist, for May, contains the following articles: — Grout, "Some interesting forms of *Polytrichum*"; E. G. Britton, "Notes on nomenclature — II"; Bailey, "An interesting tree"; Grout, "Sun prints in bryology — additional notes"; Holzinger, "Obituary, M. Emile Bescherelle," and "*Seligeria tristichoides* in southern France"; and Williams, "*Oedipodium Griffithianum*."

The *Bulletin of the Torrey Botanical Club* for April contains the following articles: — Goebel, "Regeneration in plants"; Morgan, "The hypothesis of formative stuffs"; Howe and Underwood, "The genus *Riella*, with descriptions of new species from North America and the Canary Islands"; Murrill, "The Polyporaceae of North America — III, the genus *Fomes*"; Piper, "Four new species of grasses from Washington"; Osterhout, "New plants from Colo-